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10/544,280	08/03/2005	Robert Hughes Jones	67.0977 US PCT	1320

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EXAMINER	
HUGHES, SCOTT A	
ART UNIT	**PAPER NUMBER**
3663	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/544,280	JONES, ROBERT HUGHES	
	Examiner	Art Unit	
	Scott A. Hughes	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 June 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/26/2007 has been entered.

Response to Arguments

Applicant's amendments filed 1026/2007 are sufficient to overcome the objections to the claims from the previous action.

Applicant's arguments filed 1026/2007 have been fully considered but they are not persuasive.

Applicant argues that the independent claims describe a passive seismic monitoring system and method including the limitation of "calculating an estimated time of origin for the seismic or microseismic event." Applicant argues that the cited references describe active seismic monitoring, and therefore don't read on the claim language. This argument is not persuasive because applicant does not claim passive seismic monitoring. The claim limitations only require calculating an estimated origin time for a seismic or microseismic event. The seismic disturbances generated by seismic sources that produce the seismic waves used in the cited references are a type

of seismic event, and therefore meet this claim limitation. Applicant has not claimed that the events must be passive events, and therefore active seismic events meet the claim language. Applicant argues that because the references teach active seismic events, the time of origin is known and therefore they do not calculate and estimated time of origin.

This argument is not persuasive because the references determine the values of the times based on the velocity ratio and the P and S wave arrival times. Even though the determination is for times of an active event, the claims do not include the limitation that the even must be a passive event.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6-10, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Garotta (6639871).

With regard to claim 1, Garotta discloses data processing apparatus for calculating an estimated time of arrival of a seismic or microseismic P or S wave at a

sensor location, the seismic or microseismic P or S wave being generated by a seismic or microseismic event, comprising a data processor (Column 1) that:

- calculates an estimated time of origin for the seismic or the microseismic event generating the P and S waves, based on a P to S wave velocity ratio and picked arrival times of the P and S waves at a sensor station other the one for which the estimated time of arrival of the P or S wave is to be calculated (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).
- calculates the estimated time of arrival of the P or S wave, based on a P to S wave velocity ratio, the estimated time of origin of the seismic or microseismic event and, where the estimated arrival time of a P wave is to be calculated, a picked arrival time of the S wave at the sensor station for which the estimated arrival time of the P wave is being calculated or, where the estimated arrival time of an S wave is to be calculated, a picked arrival time of the P wave at the sensor station for which the estimated arrival time of the S wave is to be calculated (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

With regard to claim 2, Garotta discloses that the data processor calculates estimated arrival times for both the P and S waves at a sensor station (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

With regard to claim 3, Garotta discloses that the data processor is configured to calculate plurality of estimated times of arrival of the P and/or S waves (Column 1, Line

65 to Column 2, Line 45) at a sensor station, based on a plurality of estimated times of origin for the seismic or the microseismic event calculated from the picked arrival times of the p and S waves at a plurality of sensor stations other than the one at which the estimated times of arrival are to be calculated (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

With regard to claim 4, Garotta discloses that the data processor is configured to display the picked arrival times and estimated arrival times in relation to each other such that the clustering pattern of the arrival times can be analyzed (Fig. 2).

With regard to claim 6, Garotta discloses that the data processor calculates one or more estimated times of arrival for the P and/or S waves at each sensor station in a network of a sensor stations, wherein for each sensor station the necessary estimated time or times of origin are calculated from the picked P and S waves at one or more of the other stations in the network (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

With regard to claim 7, Garotta discloses that the data processor receives seismic data from the sensor stations to pick arrival times for the P and S wave at each sensor station based on the seismic data (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

With regard to claim 8, Garotta discloses that with a number of possible arrival times for a wave at a sensor station (Columns 1-2), the data processor processes the possible arrival times with any estimates calculated for the arrival time of the wave at

the station in order to an arrival time of the wave at the station (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

With regard to claim 9, Garotta discloses that the data processor is configured to select or modify one of the possible arrival times in order to arrive at a final picked arrival time based on the determination (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

With regard to claim 10, Garotta discloses that the data processor processes which of the possible arrival times should be selected or modified in order to arrive at a final picked arrival time based on the determination (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

With regard to claim 12, Garotta discloses a method of calculating an estimated time of arrival of a seismic or microseismic P or S wave at a sensor station, the seismic or microseismic P or S wave being generated by a seismic or microseismic event (Column 1), the method comprising the steps of:

- calculating an estimated time of origin for the seismic or microseismic event generating the P and S waves, based on a P to S wave velocity ratio and picked arrival times of the P and S waves at a sensor station other the one for which the estimated time of arrival of the P or S wave is to be calculated (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).
- calculating the estimated time of arrival of the P or S wave, based on a P to S wave velocity ratio, the estimated time of origin of the seismic or

microseismic event and, where the estimated arrival time of a P wave is to be calculated, a picked arrival time of the S wave at the sensor station for which the estimated arrival time of the P wave is being calculated or, where the estimated arrival time of an S wave is to be calculated, a picked arrival time of the P wave at the sensor station for which the estimated arrival time of the S wave is to be calculated (Column 1, Line 25 to Column 2, Line 46; Column 3, Line 1 to Column 4, Line 52).

Claims 1-10 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang (US20030021184).

With regard to claim 1, Zhang discloses data processing apparatus for calculating an estimated time of arrival of a seismic or microseismic P or S wave at a sensor location r1, the seismic or microseismic P or S wave being generated by a seismic or microseismic event (Page 2, Column 2), comprising a data processor (abstract; Pages 7-8) that:

- calculates an estimated time of origin for the seismic or the microseismic event generating the P and S waves, based on a P to S wave velocity ratio (G) and picked arrival times of the P and S waves at a sensor station r2,r3 other the one for which the estimated time of arrival of the P or S wave is to be calculated (Figs. 1-5) ([0033]-[0156]).
- calculates the estimated time of arrival of the P or S wave, based on a P to S wave velocity ratio, the estimated time of origin of the seismic or the

microseismic event and, where the estimated arrival time of a P wave is to be calculated, a picked arrival time of the S wave at the sensor station for which the estimated arrival time of the P wave is being calculated or, where the estimated arrival time of an S wave is to be calculated, a picked arrival time of the P wave at the sensor station for which the estimated arrival time of the S wave is to be calculated (Figs. 1-5) ([0033]-[0156]).

With regard to claim 2, Zhang discloses that the data processor calculates estimated arrival times for both the P and S waves at a sensor station (Figs. 1-5) ([0033]-[0156]; especially pages 2-3).

With regard to claim 3, Zhang discloses that the data processor is configured to calculate a plurality of estimated times of arrival of the P and/or S waves at a sensor station, based on a plurality of estimated times of origin for the seismic or the microseismic event calculated from the picked arrival times of the p and S waves at a plurality of sensor stations other than the one at which the estimated times of arrival are to be calculated (Figs. 1-6) ([0033]-[0156]).

With regard to claim 4, Zhang discloses that the data processor is configured to display the picked arrival times and estimated arrival times in relation to each other such that the clustering pattern of the arrival times can be analyzed (Figs. 1-6) (Pages 2-6).

With regard to claim 5, Zhang discloses that the data processor comprises a display for displaying information regarding the calculation of any particular estimated arrival time in response to the selection of the estimated arrival time by a user (Figs. 1-6) (Pages 2-6).

With regard to claim 6, Zhang discloses that the data processor calculates one or more estimated times of arrival for the P and/or S waves at each sensor station in a network of a sensor stations r1,r2,r3, wherein for each sensor station the necessary estimated time or times of origin are calculated from the picked P and S waves at one or more of the other stations in the network (Figs. 1-6) ([0033]-[0156]).

With regard to claim 7, Zhang discloses that the data processor receives seismic data from the sensor stations and picks arrival times for the P and S wave at each sensor station based on the received seismic data ([0033]-[0156]).

With regard to claim 8, Zhang discloses that with a number of possible arrival times for a wave at a sensor station, the processor processes the possible arrival times with any estimates calculated for the arrival time of the wave at the station in order to an arrival time of the wave at the station ([0033]-[0156]).

With regard to claim 9, Zhang discloses that the data processor is configured to select or modify one of the possible arrival times in order to arrive at a final picked arrival time based on the determination ([0033]-[0156], especially pages 3-5).

With regard to claim 10, Zhang discloses that the data processor processes which of the possible arrival times should be selected or modified in order to arrive at a final picked arrival time based on the determination ([0033]-[0156], especially pages 3-5).

With regard to claim 12, Zhang discloses a method of calculating an estimated time of arrival of a seismic or microseismic P or S wave at a sensor station r1, the

seismic or microseismic P or S wave being generated by a seismic or microseismic event (Page 2, Column 2), the method comprising the steps of:

- calculating an estimated time of origin for the seismic or microseismic event generating the P and S waves, based on a P to S wave velocity ratio and picked arrival times of the P and S waves at a sensor station other the one for which the estimated time of arrival of the P or S wave is to be calculated (Figs. 1-5) ([0033]-[0156]).
- calculating the estimated time of arrival of the P or S wave, based on a P to S wave velocity ratio, the estimated time of origin of the seismic or microseismic event and, where the estimated arrival time of a P wave is to be calculated, a picked arrival time of the S wave at the sensor station for which the estimated arrival time of the P wave is being calculated or, where the estimated arrival time of an S wave is to be calculated, a picked arrival time of the P wave at the sensor station for which the estimated arrival time of the S wave is to be calculated(Figs. 1-5) ([0033]-[0156]).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 8-10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Audebert (WO0131364).

With regard to claim 1, Audebert discloses data processing appratus for calculating an estimated time of arrival of a seismic or microseismic P or S wave at a sensor location, the seismic or microseismic P or S wave being generated by a seismic or microseismic event (abstract, Column 1), comprising a data processor that:

- calculates an estimated time of origin for the seismic or the microseismic event generating the P and S waves, based on a P to S wave velocity ratio and picked arrival times of the P and S waves at a sensor station other the one for which the estimated time of arrival of the P or S wave is to be calculated (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).
- calculates the estimated time of arrival of the P or S wave, based on a P to S wave velocity ratio, the estimated time of origin of the seismic or microseismic event and, where the estimated arrival time of a P wave is to be calculated, a picked arrival time of the S wave at the sensor station for which the estimated arrival time of the P wave is being calculated or, where the estimated arrival time of an S wave is to be calculated, a picked arrival time of the P wave at the sensor station for which the estimated arrival time of the S wave is to be calculated (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).

With regard to claim 2, Audebert discloses that the data processor calculates estimated arrival times for both the P and S waves at a sensor station (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).

With regard to claim 3, Audebert discloses that the data processor is configured to calculate a plurality of estimated times of arrival of the P and/or S waves at a sensor station, based on a plurality of estimated times of origin for the seismic or the microseismic event calculated from the picked arrival times of the p and S waves at a plurality of sensor stations other than the one at which the estimated times of arrival are to be calculated (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).

With regard to claim 8, Audebert discloses that with a number of possible arrival times for a wave at a sensor station, the processor processes the possible arrival times with any estimates calculated for the arrival time of the wave at the station in order to determine an arrival time of the wave at the station (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).

With regard to claim 9, Audebert discloses that the data processor is configured to select or modify one of the possible arrival times in order to arrive at a final picked arrival time based on the determination (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).

With regard to claim 10, Audebert discloses that the data processor processes which of the possible arrival times should be selected or modified in order to arrive at a final picked arrival time based on the determination (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).

With regard to claim 12, Audebert discloses a method of calculating an estimated time of arrival of a seismic or microseismic P or S wave at a sensor station, the seismic

or microseismic P or S wave being generated by a seismic or microseismic event (abstract; Column 1), the method comprising the steps of:

- calculating an estimated time of origin for the seismic or the microseismic event generating the P and S waves, based on a P to S wave velocity ratio and picked arrival times of the P and S waves at a sensor station other the one for which the estimated time of arrival of the P or S wave is to be calculated (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).
- calculating the estimated time of arrival of the P or S wave, based on a P to S wave velocity ratio, the estimated time of origin of the seismic or microseismic event and, where the estimated arrival time of a P wave is to be calculated, a picked arrival time of the S wave at the sensor station for which the estimated arrival time of the P wave is being calculated or, where the estimated arrival time of an S wave is to be calculated, a picked arrival time of the P wave at the sensor station for which the estimated arrival time of the S wave is to be calculated (Page 2, Line 10 to Page 3, Line 25; Page 4, Line 11 to Page 13, Line 4) (Figs. 1-3).

Claims 1-3 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Sayers (6067275).

With regard to claim 1, Sayers discloses data processing appratus for calculating an estimated time of arrival of a seismic or microseismic P or S wave at a sensor

location, the seismic or microseismic P or S wave being generated by a seismic or microseismic event (Column 3, Lines 30-50), comprising a data processor that:

- calculates an estimated time of origin for the seismic or microseismic event generating the P and S waves, based on a P to S wave velocity ratio and picked arrival times of the P and S waves at a sensor station other the one for which the estimated time of arrival of the P or S wave is to be calculated (Column 6, Line 16 to Column 8, Line 30) (Figs. 3-5a).
- calculates the estimated time of arrival of the P or S wave, based on a P to S wave velocity ratio, the estimated time of origin of the seismic or microseismic event and, where the estimated arrival time of a P wave is to be calculated, a picked arrival time of the S wave at the sensor station for which the estimated arrival time of the P wave is being calculated or, where the estimated arrival time of an S wave is to be calculated, a picked arrival time of the P wave at the sensor station for which the estimated arrival time of the S wave is to be calculated (Column 6, Line 16 to Column 8, Line 30) (Figs. 3-5a).

With regard to claim 2, Sayers discloses that the data processor calculates estimated arrival times for both the P and S waves at a sensor station (Column 6, Line 16 to Column 8, Line 30) (Figs. 3-5a).

With regard to claim 3, Sayers discloses the data processor is configured to calculate a plurality of estimated times of arrival of the P and/or S waves at a sensor station, based on a plurality of estimated times of origin for the seismic or the

microseismic event calculated from the picked arrival times of the p and S waves at a plurality of sensor stations other than the one at which the estimated times of arrival are to be calculated (Column 6, Line 16 to Column 8, Line 30) (Figs. 3-5a).

With regard to claim 12, Sayers discloses a method of calculating an estimated time of arrival of a seismic or microseismic P or S wave at a sensor station, the seismic or microseismic P or S wave being generated by a seismic or microseismic event (Column 3, Lines 30-50), the method comprising the steps of:

- calculating an estimated time of origin for the seismic or microseismic event generating the P and S waves, based on a P to S wave velocity ratio and picked arrival times of the P and S waves at a sensor station other the one for which the estimated time of arrival of the P or S wave is to be calculated (Column 6, Line 16 to Column 8, Line 30) (Figs. 3-5a).
- calculating the estimated time of arrival of the P or S wave, based on a P to S wave velocity ratio, the estimated time of origin of the seismic or microseismic event and, where the estimated arrival time of a P wave is to be calculated, a picked arrival time of the S wave at the sensor station for which the estimated arrival time of the P wave is being calculated or, where the estimated arrival time of an S wave is to be calculated, a picked arrival time of the P wave at the sensor station for which the estimated arrival time of the S wave is to be calculated (Column 6, Line 16 to Column 8, Line 30) (Figs. 3-5a).

Conclusion

The cited prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A. Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAH

SUPERVISORY PATENT EXAMINER